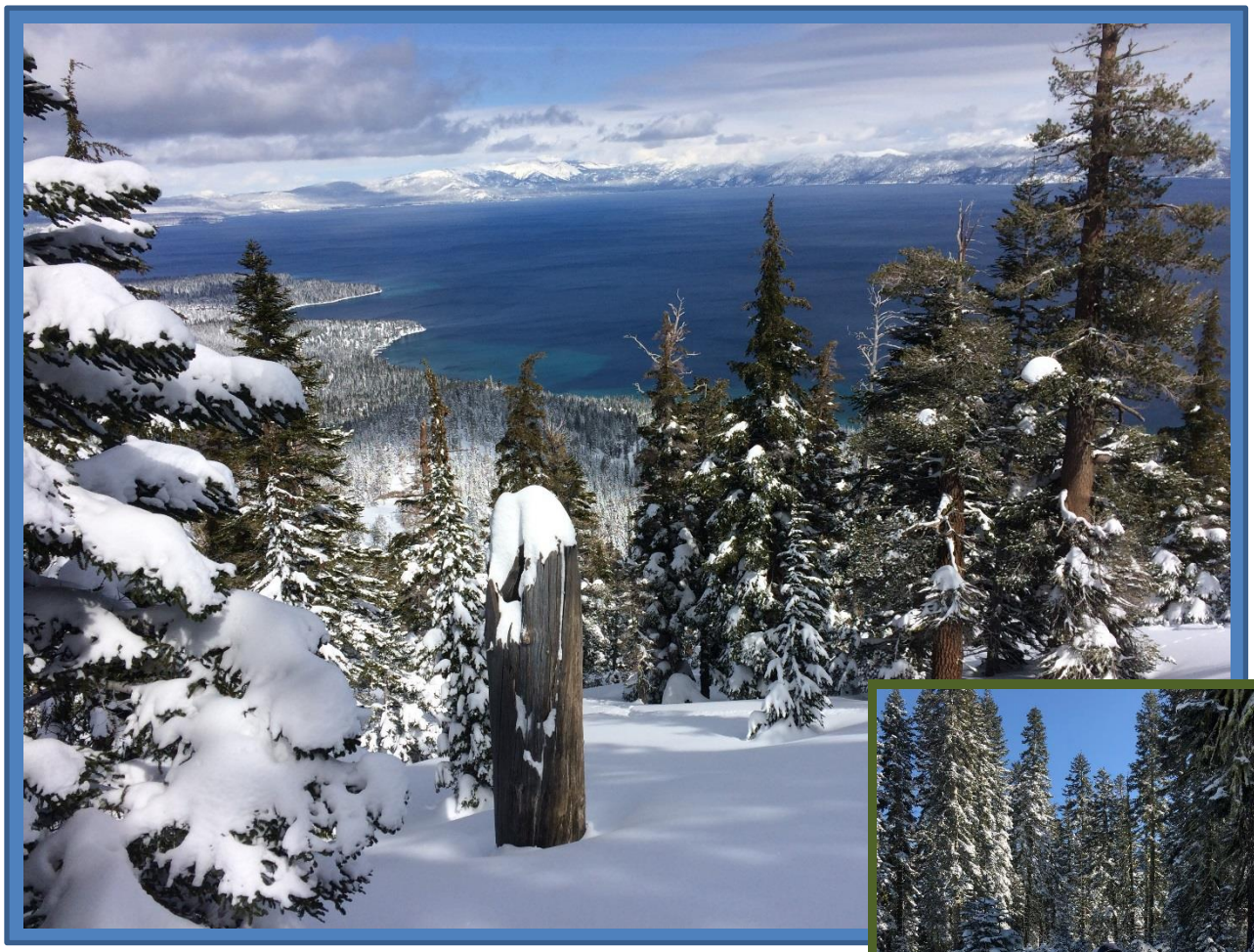
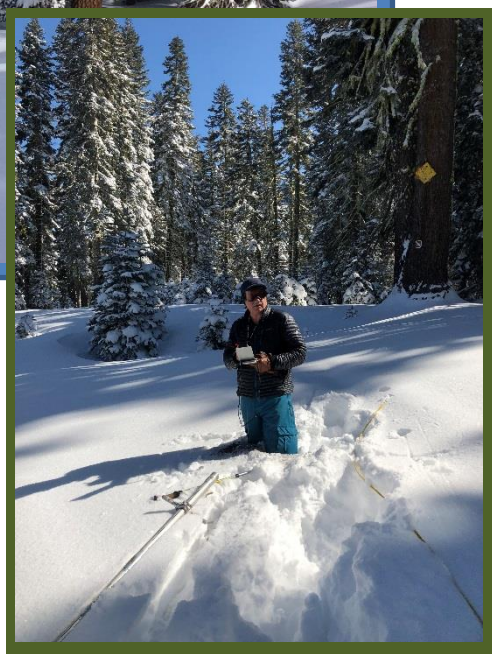
**UNITED STATES DEPARTMENT OF AGRICULTURE**
**NATURAL RESOURCES CONSERVATION SERVICE**

# California Water Supply Outlook Report

March 1, 2018

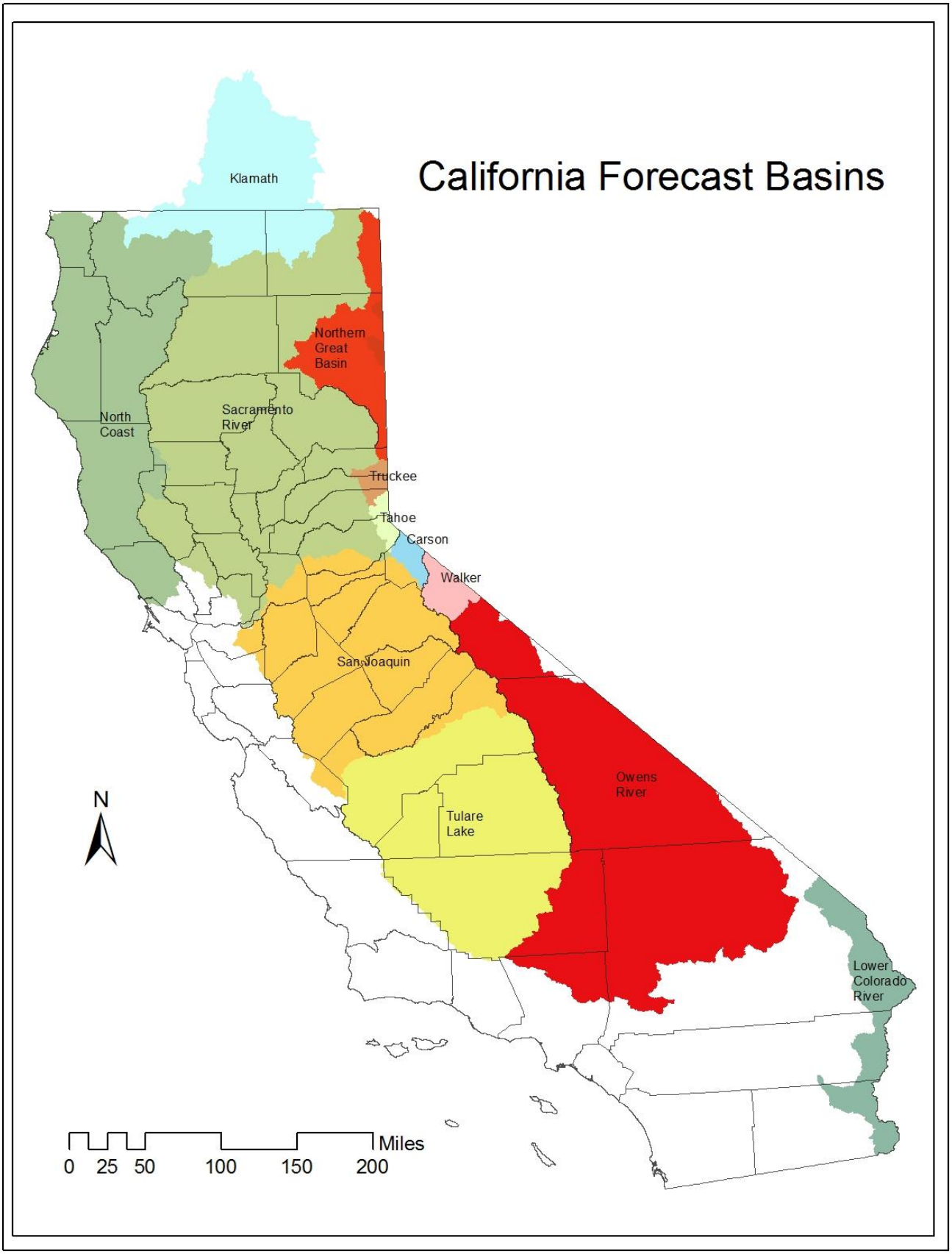




# Contents



*Cover photos: Upper- View of Lake Tahoe from the Rubicon Peak #2 Snow Course/SNOTEL sites, taken on February 24, 2018. SNOTEL recorded a snow depth of 15 inches at this location at the beginning of March, compared to 4 inches at the beginning of January (https://wcc.sc.egov.usda.gov/nwcc/snow-course-sites.jsp?state=CA) . Lower right- NRCS District Conservationist Dan Martynn recording data at the Squaw Valley #2 Snow Course on February 27, 2018. The nearby SNOTEL site recorded 36 inches of snow depth at the beginning of March. Photos courtesy of Evan Smith, NRCS, Grass Valley.*


California Forecast Basins
Klamath
Northern Great Basin
North Coast
Sacramento River
Truckee
Tahoe
Carson
Walker
San Joaquin
Owens River
Tulare Lake
Lower Colorado River
N
0 25 50 100 150 200
Miles

# STATE OF CALIFORNIA GENERAL OUTLOOK
**March, 2018**

## SUMMARY

A high pressure system stalled off California's coast through most of February, effectively shutting off all storm activity and further entrenching the state's path towards a very dry water year. The storm track shifted on or around February 22nd, bringing cold air and snow down from Canada, and boosting snowfall and precipitation totals across the state. Weather forecasts calling for continued storm activity through mid-March raise hopes for a "March miracle", although with snowpack still so low, a "March mitigation" would be a more realistic prospect (California Weather Blog).

## SNOWPACK

Warm, dry conditions in early- to mid-February took a toll on what was already a sparse Sierra snowpack; the statewide average snow water equivalent steadily declined from 27% of average for February 1, to a low of 19% on February 22nd, before notching up slightly to 23% by month's end. With the stormy pattern rolling into March, the Sierra snowpack has continued to improve but - at 38% of the March 14 average, is still very low.

More information is available online at http://cdec.water.ca.gov/snow/current/snow/index2.html.

## PRECIPITATION

Late February's storms also boosted precipitation totals, but couldn't make up for the extraordinarily dry conditions at the beginning of the month. February's precipitation totals for the Northern Sierra (8-Station index), San Joaquin (5-Station index), and Tulare Basin (6-Station index) Regions, were 20-, 16-, and 14% of the monthly average, respectively. The southern Sierras in particular remain very dry; even with the Tulare Basin stations receiving 82% of their monthly average in the first two weeks of March, the 9 inches of accumulated precipitation so far this season represents less than 50% of the seasonal average to date.

More information is available online at http://cdec.water.ca.gov/snow_rain.html

## RESERVOIRS

Total storage in California's reservoirs was 100% of average as of February 28th. The Central Coast's six reservoirs posted the lowest, at just 59% of average, with San Francisco Bay and South Coast regions' reservoirs also below average overall. Reservoir storage in the remaining basins are close to or above average. Lake Powell storage increased in February, from 69% to 80% by month's end, with forecast inflows between April and July holding steady.

More information is available online at http://cdec.water.ca.gov/snow/reservoir_ss.html.

## STREAMFLOW

Forecasted flows for all reported streams are below normal, due to the lack of precipitation and low snowpack to date. The streamflow forecasts for the major basins in California are summarized below.

# Sacramento River Basin

Forecasted streamflow volumes for this April through July range between 32- and 79 percent. Compared to February, NWS forecasts increased slightly, while DWR forecasts declined on the order of 10-20 percent.

SACRAMENTO RIVER BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Sacramento R at Shasta (DWR) | | | | | | | |
| APR-JUL | | | 125 | 42 | | | 295 |
| Sacramento R at Shasta (NWS) | | | | | | | |
| APR-JUL | 87 | 114 | 177 | 57 | 258 | 393 | 312 |
| McCloud R ab Shasta (DWR) | | | | | | | |
| APR-JUL | | | 300 | 79 | | | 379 |
| McCloud R ab Shasta (NWS) | | | | | | | |
| APR-JUL | 221 | 239 | 281 | 73 | 331 | 418 | 385 |
| Pit R at Shasta Lk (DWR) | | | | | | | |
| APR-JUL | | | 800 | 78 | | | 1020 |
| Pit R at Shasta Lk (NWS) | | | | | | | |
| APR-JUL | 544 | 579 | 634 | 63 | 778 | 960 | 1013 |
| Inflow to Shasta Lk (DWR) | | | | | | | |
| APR-JUL | 940 | | 1250 | 71 | | 1510 | 1756 |
| OCT-SEP | 3065 | | 3615 | 62 | | 4075 | 5831 |
| Inflow to Shasta Lk (NWS) | | | | | | | |
| APR-JUL | 985 | 1054 | 1297 | 72 | 1646 | 2166 | 1803 |
| Sacramento R nr Red Bluff (DWR) | | | | | | | |
| APR-JUL | 1130 | | 1530 | 63 | | 1870 | 2421 |
| OCT-SEP | 3930 | | 4650 | 54 | | 5260 | 8544 |
| Sacramento R nr Red Bluff (NWS) | | | | | | | |
| APR-JUL | 1347 | 1420 | 1749 | 71 | 2321 | 3149 | 2479 |
| Feather R at Lk Almanor (DWR) | | | | | | | |
| APR-JUL | | | 150 | 45 | | | 333 |
| NF Feather R at Pulga (DWR) | | | | | | | |
| APR-JUL | | | 360 | 35 | | | 1028 |
| NF Feather R nr Prattville (NWS) | | | | | | | |
| APR-JUL | 129 | 146 | 169 | 51 | 220 | 254 | 333 |
| MF Feather R nr Clio (DWR) | | | | | | | |
| APR-JUL | | | 30 | 35 | | | 86 |
| SF Feather R at Ponderosa Dam (DWR) | | | | | | | |
| APR-JUL | | | 35 | 32 | | | 110 |
| Inflow to Oroville Res (DWR) | | | | | | | |
| APR-JUL | 390 | | 610 | 36 | | 810 | 1704 |
| OCT-SEP | 1770 | | 2195 | 50 | | 2580 | 4407 |

# Sacramento River Basin (cont'd)

SACRAMENTO RIVER BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Inflow to Oroville Res (NWS) | | | | | | | |
| APR-JUL | 491 | 591 | 811 | 48 | 1292 | 1796 | 1701 |
| N Yuba R bl Goodyears Bar (DWR) | | | | | | | |
| APR-JUL | | | 115 | 41 | | | 279 |
| N Yuba R bl Goodyears Bar (NWS) | | | | | | | |
| APR-JUL | 87 | 114 | 159 | 58 | 238 | 315 | 273 |
| Inflow Jackson Mdws & Bowman Res (DWR) | | | | | | | |
| APR-JUL | | | 45 | 40 | | | 112 |
| S Yuba R nr Langs Crossing (DWR) | | | | | | | |
| APR-JUL | | | 100 | 43 | | | 233 |
| Yuba R at Smartville (DWR) | | | | | | | |
| APR-JUL | 260 | | 400 | 41 | | 520 | 968 |
| OCT-SEP | 1020 | | 1265 | 56 | | 1475 | 2268 |
| Yuba R at Smartville (NWS) | | | | | | | |
| APR-JUL | 318 | 423 | 552 | 56 | 907 | 1180 | 981 |
| NF American R at N FK Dam (DWR) | | | | | | | |
| APR-JUL | | | 100 | 38 | | | 262 |
| MF American R nr Auburn (DWR) | | | | | | | |
| APR-JUL | | | 200 | 38 | | | 522 |
| MF American R nr Auburn (NWS) | | | | | | | |
| APR-JUL | 160 | 219 | 265 | 54 | 435 | 590 | 490 |
| Inflow to Union Valley Res (NWS) | | | | | | | |
| APR-JUL | 26 | 36 | 48 | 49 | 71 | 103 | 98 |
| Silver Ck bl Camino Div. Dam (DWR) | | | | | | | |
| APR-JUL | | | 70 | 41 | | | 173 |
| Silver Ck bl Camino Div. Dam (NWS) | | | | | | | |
| APR-JUL | 50 | 70 | 88 | 56 | 131 | 190 | 158 |
| Inflow to Folsom Res (DWR) | | | | | | | |
| APR-JUL | 290 | | 450 | 38 | | 600 | 1199 |
| OCT-SEP | 1080 | | 1350 | 51 | | 1605 | 2626 |
| Inflow to Folsom Res (NWS) | | | | | | | |
| APR-JUL | 336 | 494 | 617 | 50 | 1024 | 1550 | 1232 |

The average is based on the 1981-2010 reference period.

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

# San Joaquin River Basin

Forecasted streamflow volumes for this April through July remain well below average, ranging between 28-60 percent. Compared to January, NWS forecasts increased up to 15 percent, while DWR's declined as much as 25 percent.

SAN JOAQUIN RIVER BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Cosumnes R at Michigan Bar (DWR) | | | | | | | |
| APR-JUL | 20 | | 35 | 28 | | 65 | 125 |
| OCT-SEP | 90 | | 125 | 33 | | 190 | 379 |
| Cosumnes R at Michigan Bar (NWS) | | | | | | | |
| APR-JUL | 27 | 38 | 52 | 41 | 95 | 181 | 128 |
| NF Mokelumne R nr West Point (DWR) | | | | | | | |
| APR-JUL | | | 160 | 37 | | | 437 |
| Inflow to Pardee Res (DWR) | | | | | | | |
| APR-JUL | 120 | | 170 | 37 | | 250 | 457 |
| OCT-SEP | 285 | | 355 | 48 | | 465 | 748 |
| Inflow to Pardee Res (NWS) | | | | | | | |
| APR-JUL | 163 | 209 | 270 | 58 | 363 | 501 | 467 |
| MF Stanislaus R bl Beardsley (DWR) | | | | | | | |
| APR-JUL | | | 120 | 36 | | | 334 |
| Inflow to New Melones Res (DWR) | | | | | | | |
| APR-JUL | 180 | | 240 | 35 | | 360 | 682 |
| Inflow to New Melones Resr (DWR) | | | | | | | |
| OCT-SEP | 285 | | 510 | 44 | | 675 | 1149 |
| Inflow to New Melones Res (NWS) | | | | | | | |
| APR-JUL | 226 | 267 | 359 | 52 | 514 | 747 | 690 |
| Cherry & Eleanor Cks, Hetch Hetchy (DWR) | | | | | | | |
| APR-JUL | | | 130 | 41 | | | 315 |
| Tuolumne R nr Hetch Hetchy (DWR) | | | | | | | |
| APR-JUL | | | 260 | 43 | | | 604 |
| Tuolumne R nr Hetch Hetchy (NWS) | | | | | | | |
| APR-JUL | 263 | 305 | 356 | 60 | 470 | 585 | 596 |
| Inflow to New Don Pedro Res (DWR) | | | | | | | |
| APR-JUL | 350 | | 490 | 41 | | 640 | 1193 |
| OCT-SEP | 715 | | 900 | 47 | | 1095 | 1909 |
| Inflow to New Don Pedro Res (NWS) | | | | | | | |
| APR-JUL | 487 | 577 | 697 | 57 | 993 | 1274 | 1228 |

# San Joaquin River Basin (cont'd)

SAN JOAQUIN RIVER BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Merced R, Pohono Bridge Yosemite(DWR) | | | | | | | |
| APR-JUL | | | 120 | 32 | | | 372 |
| Merced R, Pohono Bridge Yosemite (NWS) | | | | | | | |
| APR-JUL | 155 | 186 | 228 | 59 | 317 | 387 | 385 |
| Inflow to Lake McClure (NWS) | | | | | | | |
| APR-JUL | 209 | 245 | 315 | 49 | 467 | 608 | 642 |
| San Joaquin R at Mammoth Pool (DWR) | | | | | | | |
| APR-JUL | | | 390 | 38 | | | 1026 |
| Big Ck bl Huntington Lk (DWR) | | | | | | | |
| APR-JUL | | | 30 | 33 | | | 91 |
| SF San Joaquin R nr Florence Lk (DWR) | | | | | | | |
| APR-JUL | | | 90 | 45 | | | 201 |
| Inflow to Millerton Lk (DWR) | | | | | | | |
| APR-JUL | 320 | | 450 | 37 | | 570 | 1228 |
| OCT-SEP | 560 | | 725 | 40 | | 880 | 1793 |
| Inflow to Millerton Lk (NWS) | | | | | | | |
| APR-JUL | 382 | 538 | 682 | 54 | 926 | 1360 | 1258 |

The average is based on the 1981-2010 reference period.

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

# Tulare Lake Basin

Forecasted streamflow volumes for this April through July are all below 50 percent of average.

TULARE LAKE BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| NF Kings R nr Cliff Camp (DWR) | | | | | | | |
| APR-JUL | | | 70 | 29 | | | 239 |
| Inflow to Pine Flat Res (DWR) | | | | | | | |
| APR-JUL | 240 | | 370 | 31 | | 490 | 1210 |
| OCT-SEP | 435 | | 600 | 35 | | 750 | 1702 |
| Inflow to Pine Flat Res (NWS) | | | | | | | |
| APR-JUL | 342 | 471 | 588 | 48 | 921 | 1155 | 1231 |
| Kaweah R at Terminus Res (DWR) | | | | | | | |
| APR-JUL | 40 | | 65 | 23 | | 90 | 285 |
| OCT-SEP | 90 | | 125 | 28 | | 160 | 451 |
| Kaweah R at Terminus Res (NWS) | | | | | | | |
| APR-JUL | 38 | 66 | 100 | 35 | 188 | 291 | 288 |
| Tule R at Success Res (DWR) | | | | | | | |
| APR-JUL | 6.0 | | 12.0 | 19 | | 19.0 | 63 |
| OCT-SEP | 25 | | 36 | 25 | | 50 | 147 |
| Tule R at Success Res (NWS) | | | | | | | |
| APR-JUL | 6.0 | 11.0 | 16.0 | 25 | 32 | 60 | 63 |
| Kern R nr Kernville (DWR) | | | | | | | |
| APR-JUL | | | 150 | 39 | | | 384 |
| Inflow to Isabella Res (DWR) | | | | | | | |
| APR-JUL | 115 | | 175 | 38 | | 245 | 458 |
| OCT-SEP | 265 | | 340 | 47 | | 430 | 728 |
| Inflow to Isabella Res (NWS) | | | | | | | |
| APR-JUL | 68 | 97 | 136 | 30 | 206 | 276 | 454 |

The average is based on the 1981-2010 reference period.

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

# North Coast Area Basin

Forecast streamflow volumes for this April through July remain below average

NORTH COASTAL AREA
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Trinity R at Lewiston (DWR) | | | | | | | |
| APR-JUL | 120 | | 190 | 30 | | 280 | 639 |
| OCT-SEP | 345 | | 445 | 33 | | 575 | 1348 |
| Inflow to Clair Engle Lk (NWS) | | | | | | | |
| APR-JUL | 177 | 242 | 350 | 53 | 492 | 615 | 666 |
| Scott R nr Fort Jones (NWS) | | | | | | | |
| APR-JUL | 32 | 43 | 63 | 36 | 114 | 139 | 173 |

The average is based on the 1981-2010 reference period.

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

# Klamath Basin

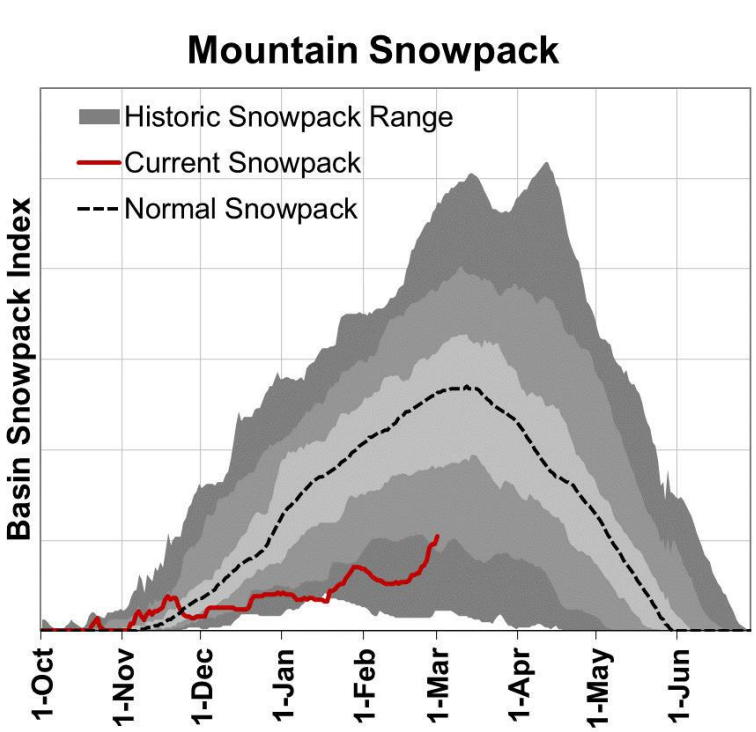
From the Water Supply Outlook Report for Oregon (March 1, 2018)
https://www.wcc.nrcs.usda.gov/ftpref/states/or/watersupply/2018/WSOR_2018_Mar.pdf):

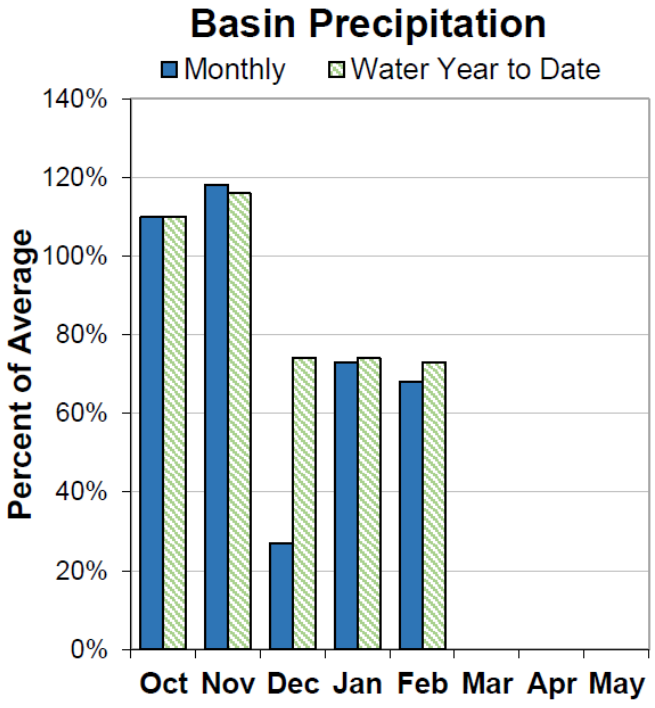
Snowpack: As of March 1, the basin snowpack was 46% of normal. This is slightly higher than last month when the snowpack was 42% of normal.

Precipitation: February precipitation was 68% of average. Precipitation since the beginning of the water year (October 1 - March 1) has been 73% of average.

Reservoirs: As of March 1, storage at major reservoirs in the basin ranges from 93% of average at Clear Lake to 125% of average at Gerber Reservoir.

Streamflow Forecast: The April through September streamflow forecasts in the basin range from 24% to 58% of average. Overall, forecasts remain similar to last month's report. Water users in the basin without access to reservoir water should anticipate water shortages this coming summer and begin to prepare accordingly.



# Klamath Basin (cont'd)

KLAMATH BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Gerber Res Inflow (2) | | | | | | | |
| MAR-JUL | 1.2 | 5.4 | 9.9 | 31 | 15.9 | 27 | 32 |
| APR-SEP | 0 | 1.01 | 3.4 | 24 | 7.3 | 15.6 | 14.4 |
| Sprague R nr Chiloquin | | | | | | | |
| MAR-JUL | 59 | 88 | 111 | 44 | 136 | 178 | 255 |
| MAR-SEP | 71 | 102 | 127 | 46 | 154 | 198 | 275 |
| APR-JUL | 40 | 62 | 81 | 43 | 101 | 136 | 188 |
| APR-SEP | 52 | 77 | 97 | 46 | 119 | 155 | 210 |
| Williamson R bl Sprague R | | | | | | | |
| MAR-JUL | 97 | 165 | 210 | 53 | 255 | 325 | 400 |
| MAR-SEP | 142 | 215 | 260 | 57 | 310 | 380 | 460 |
| APR-JUL | 62 | 117 | 155 | 53 | 193 | 250 | 295 |
| APR-SEP | 107 | 166 | 205 | 58 | 245 | 305 | 355 |
| Upper Klamath Lake Inflow (1,2) | | | | | | | |
| MAR-JUL | 95 | 235 | 300 | 52 | 365 | 505 | 580 |
| MAR-SEP | 132 | 285 | 355 | 54 | 425 | 575 | 655 |
| APR-JUL | 44 | 152 | 200 | 50 | 250 | 360 | 400 |
| APR-SEP | 85 | 200 | 255 | 53 | 310 | 425 | 480 |

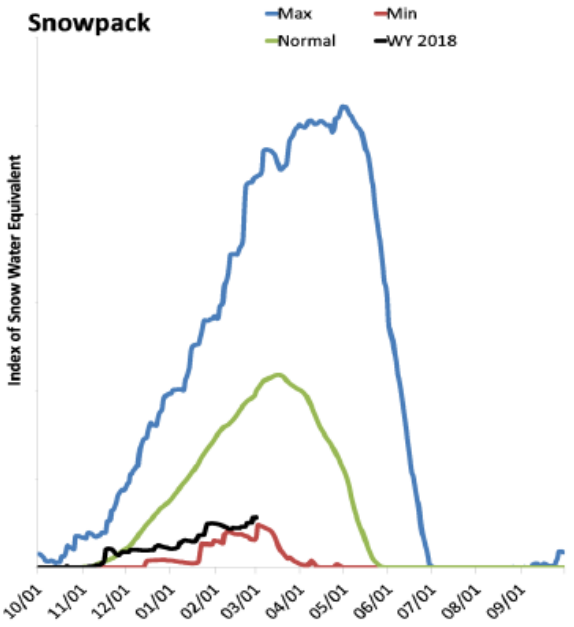
The average is based on the 1981-2010 reference period.

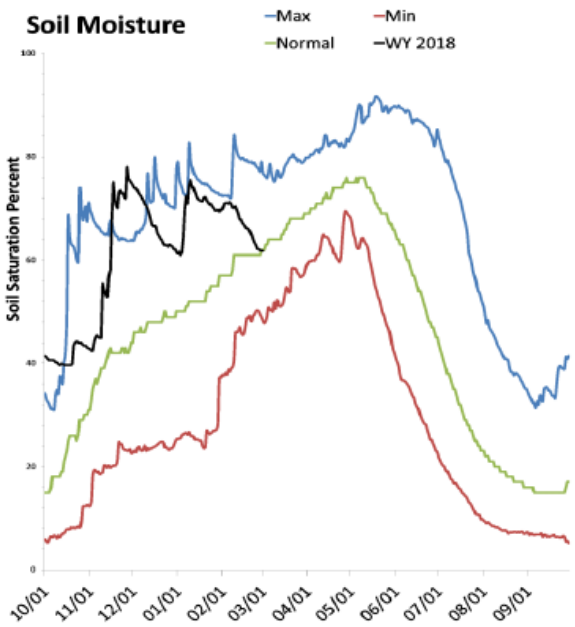
1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

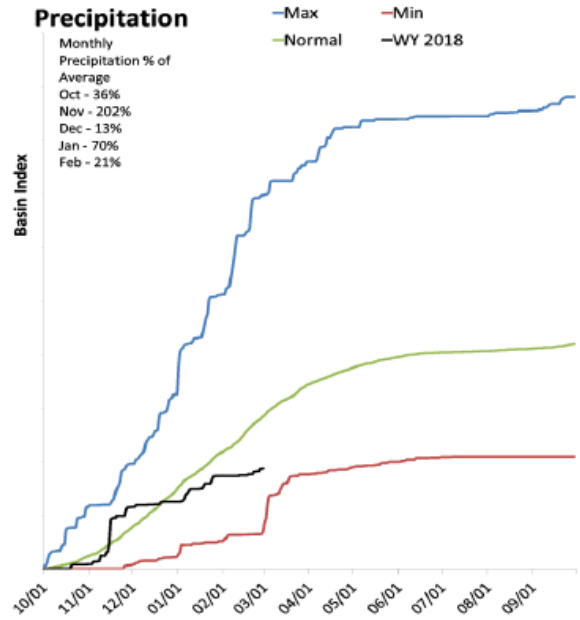
# Lake Tahoe Basin

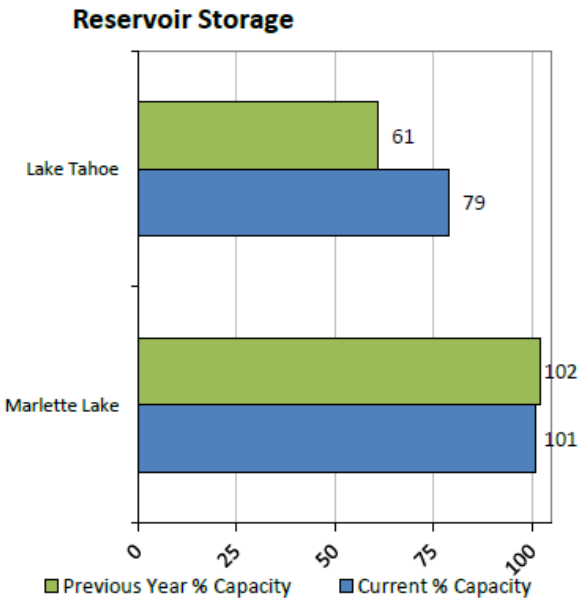
From the Water Supply Outlook Report for Nevada (March 1, 2018)
(https://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/):

Snowpack in the Lake Tahoe Basin is much below normal at 28% of median, compared to 217% last year. Precipitation in February was much below average, which brings the seasonal accumulation (Oct-Feb) to 66% of average. Soil moisture is at 62% saturation, compared to 76% last year. Lake Tahoe's water elevation is 6227.83 ft, which is 4.83 ft above the lake's natural rim and equals a storage of 588.5 thousand acre-feet. Last year its elevation was 6226.78 ft which equaled a storage of 453.9 thousand acre-feet. Lake Tahoe is forecast to rise 0.75 feet from March 1 to its highest elevation.



# Lake Tahoe Basin (cont'd)

LAKE TAHOE BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Marlette Lk Inflow (Acre-ft) (2) | | | | | | | |
| MAR-JUL | 78 | 230 | 600 | 54 | 970 | 1514 | 1110 |
| APR-JUL | 66 | 183 | 415 | 51 | 647 | 1021 | 830 |
| Lake Tahoe Rise (Gates Closed) (1) | | | | | | | |
| MAR-HIGH | 0.3 | 0.4 | 0.8 | 43 | 1.1 | 1.8 | 1.73 |
| APR-HIGH | 0.3 | 0.4 | 0.5 | 38 | 0.8 | 1.4 | 1.31 |
| Lake Tahoe Net Inflow (2) | | | | | | | |
| MAR-JUL | 5.7 | 21 | 65 | 34 | 127 | 20 | 189.3 |
| APR-JUL | 0.0 | 23 | 43 | 30 | 89 | 156 | 144.6 |

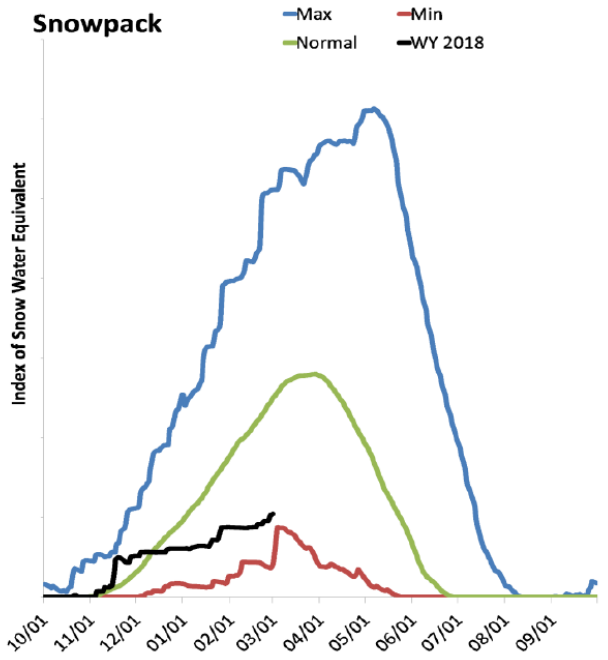
The average is based on the 1981-2010 reference period.

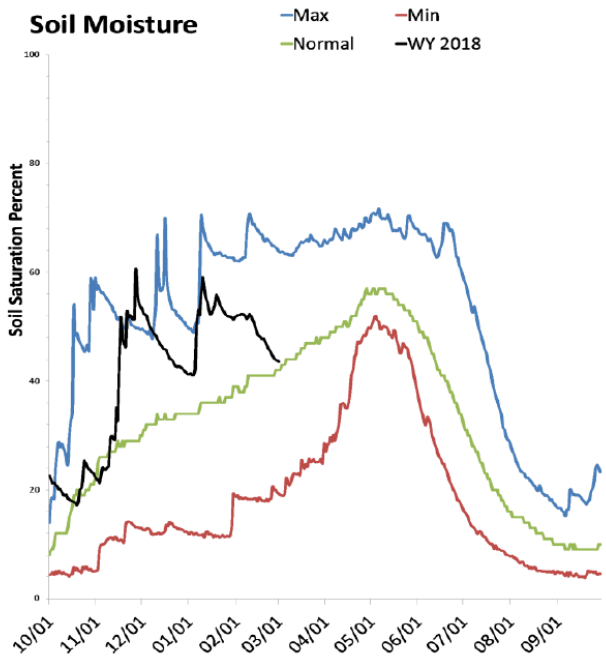
1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

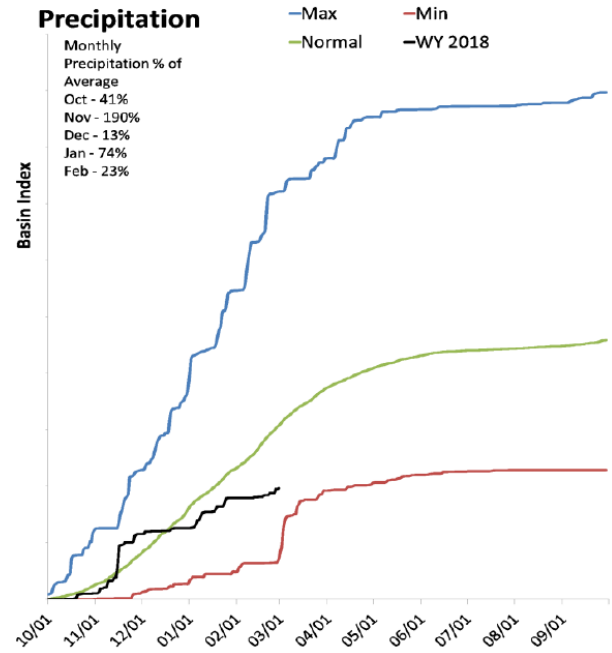
# Truckee River Basin

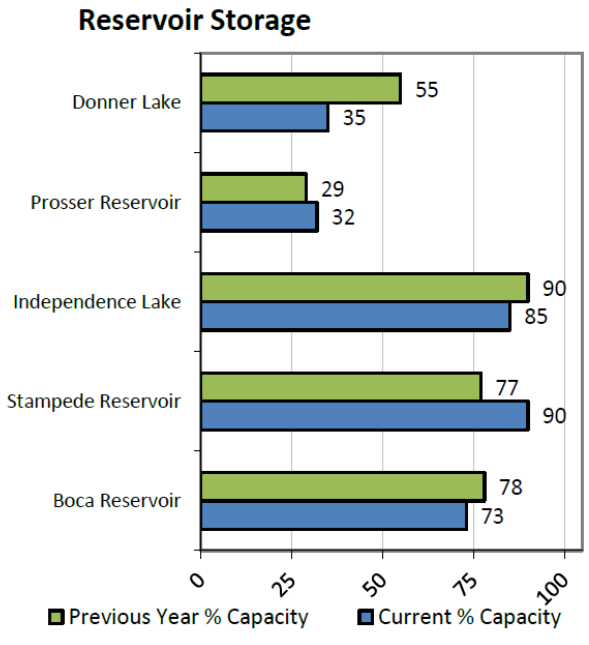
Including Information from the Water Supply Outlook Report for Nevada (March 1, 2018) (https://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/):

Snowpack in the Truckee River Basin is much below normal at 37% of median, compared to 199% last year. Precipitation in February was much below average, which brings the seasonal accumulation (Oct-Feb) to 64% of average. Soil moisture is at 44% saturation, compared to 64% last year. Combined reservoir storage is 81% of capacity, compared to 73% last year. Forecast streamflow volumes (Mar-Jul) range from 25% to 55% of average.



# Truckee River Basin (cont'd)

TRUCKEE RIVER BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Donner Lake Inflow | | | | | | | |
| MAR-JUL | 0.9 | 2.2 | 5.7 | 26 | 9.2 | 14.4 | 22 |
| APR-JUL | 0.4 | 1.8 | 4.3 | 24 | 7.5 | 11.4 | 17.8 |
| Martis Ck Res Inflow | | | | | | | |
| MAR-JUL | 0.39 | 1.38 | 4.4 | 34 | 7.4 | 11.9 | 12.91 |
| APR-JUL | 0.28 | 1.03 | 3.3 | 35 | 6.0 | 9.9 | 9.39 |
| Prosser Ck Res Inflow | | | | | | | |
| MAR-JUL | 0.8 | 10.9 | 17.7 | 35 | 25 | 35 | 51 |
| APR-JUL | 1.7 | 8.6 | 15.0 | 35 | 21 | 31 | 43 |
| Independence Res Inflow | | | | | | | |
| MAR-JUL | 0.1 | 3.2 | 5.4 | 40 | 7.6 | 10.7 | 13.5 |
| APR-JUL | 0.4 | 2.6 | 4.6 | 38 | 6.6 | 9.4 | 12.1 |
| Sagehen Ck nr Truckee | | | | | | | |
| MAR-JUL | 1.3 | 1.7 | 2.1 | 33 | 2.6 | 3.5 | 6.4 |
| APR-JUL | 1.0 | 1.4 | 1.8 | 32 | 2.3 | 3.2 | 5.6 |
| Stampede Res Local Inflow | | | | | | | |
| MAR-JUL | 2.7 | 13.8 | 32 | 35 | 50 | 77 | 90 |
| APR-JUL | 3.8 | 11.8 | 29 | 38 | 46 | 71 | 77 |
| L Truckee R ab Boca Resv | | | | | | | |
| MAR-JUL | 27 | 37 | 52 | 49 | 70 | 97 | 107 |
| APR-JUL | 30 | 39 | 42 | 48 | 72 | 100 | 88 |
| Boca Res Local Inflow | | | | | | | |
| MAR-JUL | 0.28 | 1.04 | 2.4 | 25 | 4.4 | 6.3 | 9.42 |
| APR-JUL | 0.11 | 0.66 | 1.2 | 22 | 2.5 | 5.2 | 5.5 |
| Truckee R ab Farad Sidewater | | | | | | | |
| MAR-JUL | 14.9 | 47 | 69 | 55 | 91 | 123 | 126.1 |
| APR-JUL | 5.4 | 36 | 57 | 53 | 78 | 109 | 108.09 |
| Truckee R at Farad | | | | | | | |
| MAR-JUL | 86 | 129 | 170 | 55 | 223 | 301 | 307 |
| APR-JUL | 90 | 120 | 135 | 53 | 185 | 280 | 255 |

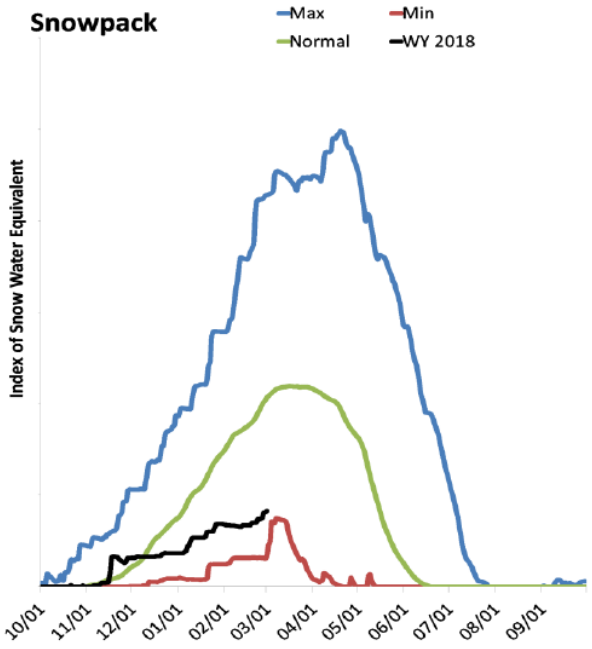
The average is based on the 1981-2010 reference period.

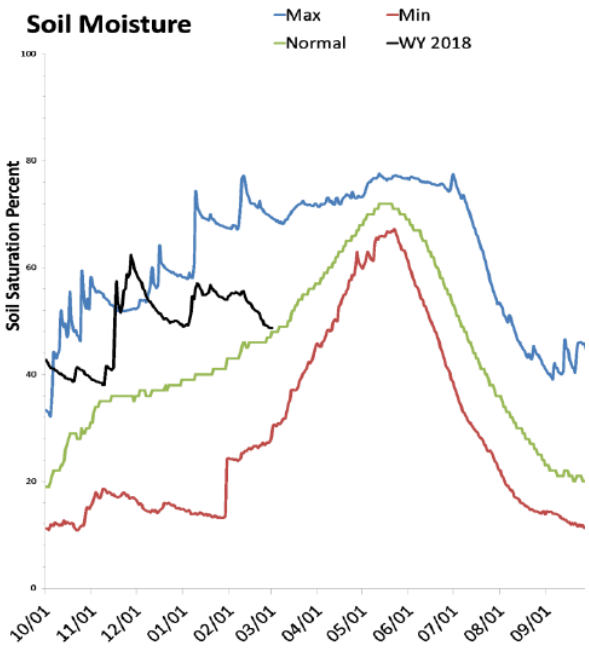
1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

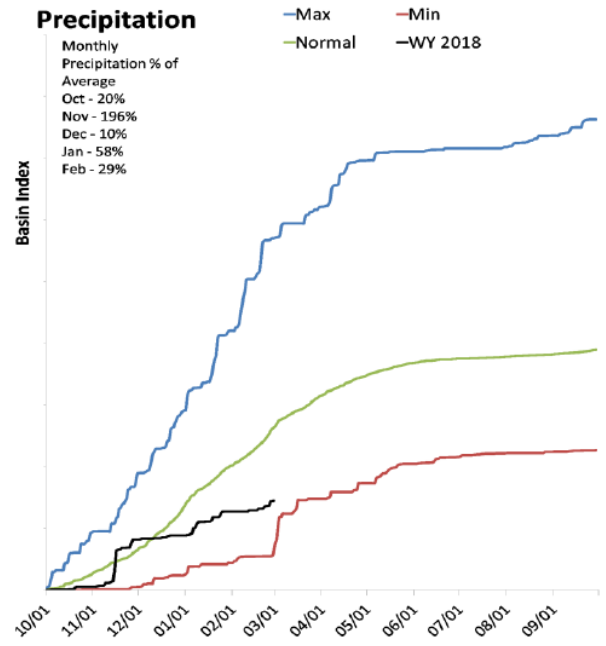
# Carson River Basin

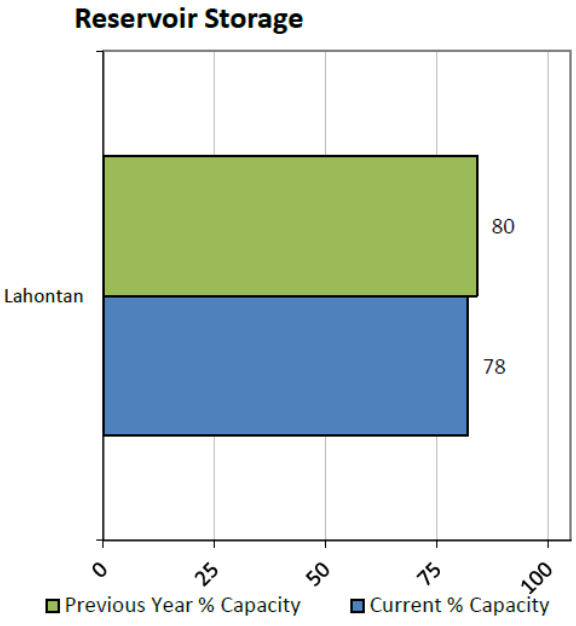
Including Information from the Water Supply Outlook Report for Nevada
(https://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/):

Snowpack in the Carson River Basin is much below normal at 40% of median, compared to 214% last year. Precipitation in February was much below average, which brings the seasonal accumulation (Oct-Feb) to 55% of average. Soil moisture is at 49% saturation, compared to 69% last year. Storage in Lahontan Reservoir is 78% of capacity, compared to 80% last year. Forecast streamflow volumes for the East- and West Forks of the Carson River (Mar-Jul) are 55% and 58% of average respectively.



# Carson River Basin (cont'd)

CARSON RIVER BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| EF Carson R nr Gardnerville | | | | | | | |
| MAR-JUL | 19.0 | 75 | 113 | 55 | 151 | 207 | 205 |
| APR-JUL | 3.0 | 59 | 97 | 52 | 135 | 191 | 186 |
| WF Carson R at Woodfords | | | | | | | |
| MAR-JUL | 6.6 | 23 | 34 | 58 | 44 | 61 | 59 |
| APR-JUL | 1.7 | 17.9 | 29 | 54 | 40 | 56 | 54 |

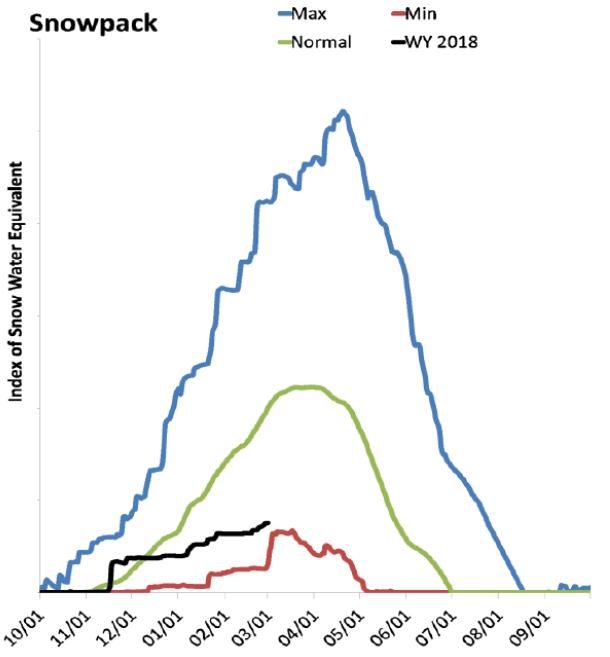
The average is based on the 1981-2010 reference period.

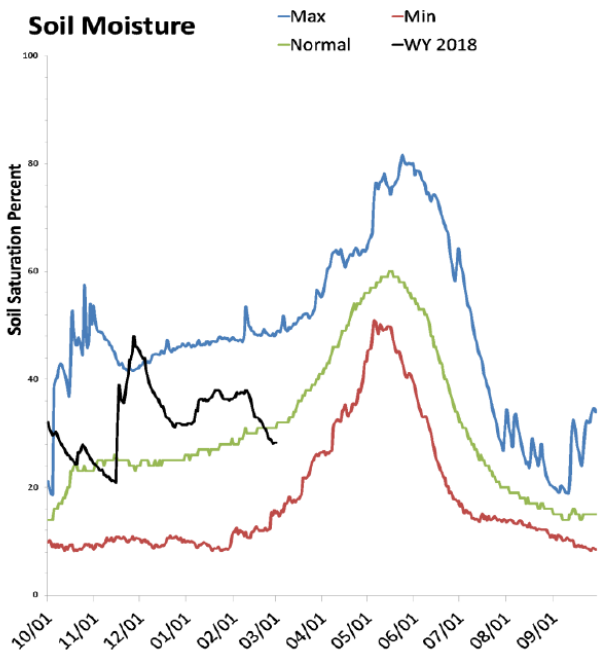
1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

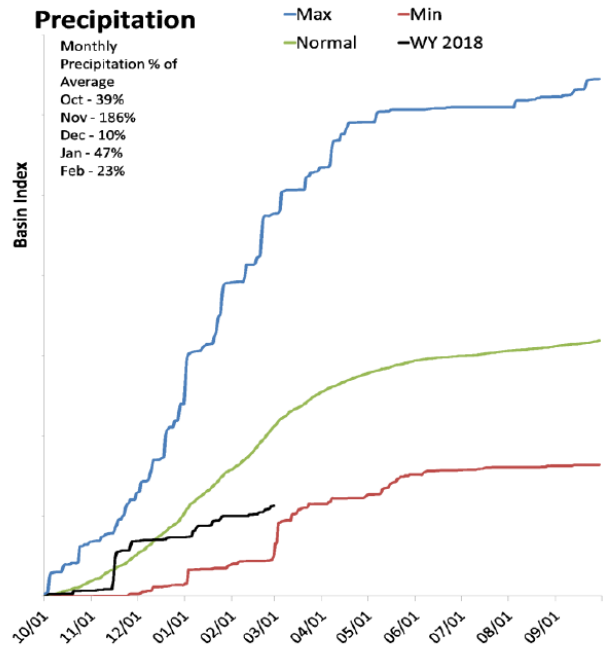
# Walker River Basin

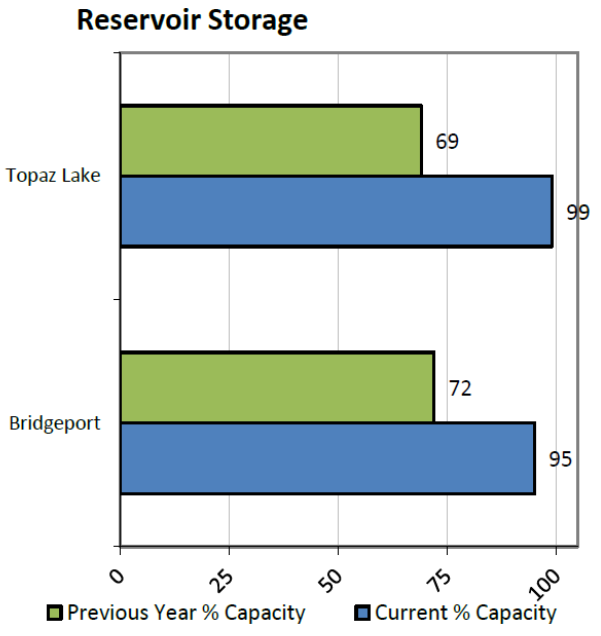
From the Water Supply Outlook Report for Nevada
(https://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/):

Snowpack in the Walker River Basin is much below normal at 38% of median, compared to 215% last year. Precipitation in February was much below average, which brings the seasonal accumulation (Oct-Feb) to 53% of average. Soil moisture is at 28% saturation, compared to 48% last year. Combined reservoir storage is 97% of capacity, compared to 70% last year. Forecast streamflow volumes (March to July or August) range from 53% to 63% of average.



# Walker River Basin (cont'd)

WALKER RIVER BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| E Walker R nr Bridgeport | | | | | | | |
| MAR-AUG | 2.3 | 24 | 41 | 53 | 58 | 81 | 78 |
| APR-AUG | 2.7 | 19.2 | 34 | 50 | 49 | 68 | 68 |
| W Walker R bl L Walker R nr Coleville | | | | | | | |
| MAR-JUL | 46 | 82 | 107 | 63 | 132 | 168 | 170 |
| APR-JUL | 40 | 76 | 100 | 62 | 124 | 160 | 162 |
| W Walker R nr Coleville | | | | | | | |
| MAR-JUL | 47 | 83 | 108 | 63 | 133 | 169 | 172 |
| APR-JUL | 41 | 77 | 101 | 62 | 125 | 161 | 163 |

The average is based on the 1981-2010 reference period.

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management

# Owens River Basin

OWENS RIVER BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Owens R (DWR) APR-SEP | | | 119 | 52 | | | 231 |

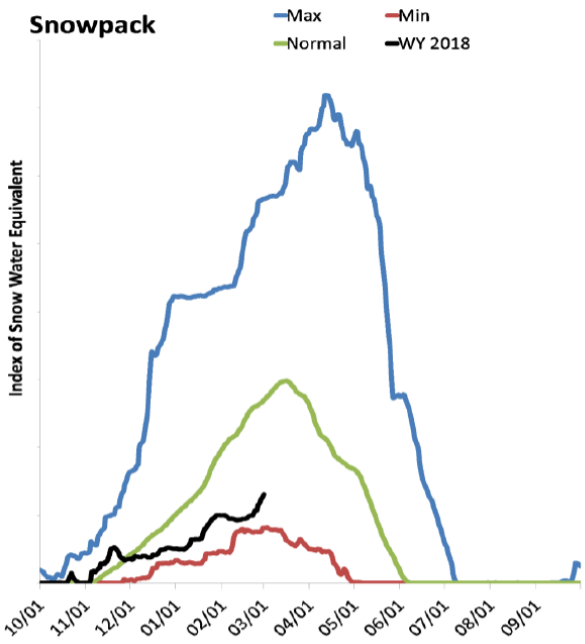
The average is based on the 1981-2010 reference period.

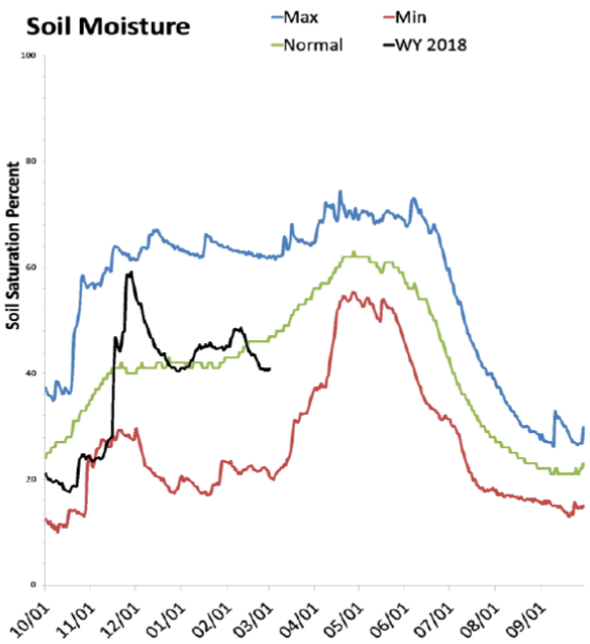
1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

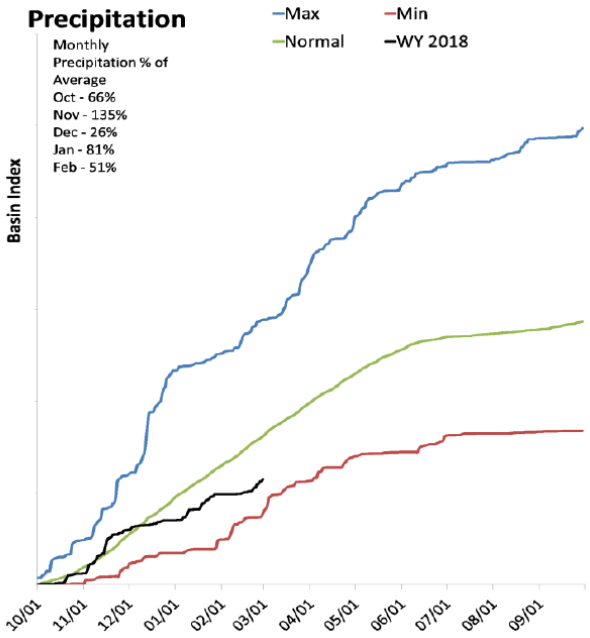
# Northern Great Basin

From the Water Supply Outlook Report for Nevada
(https://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/):

Snowpack in the Northern Great Basin is much below normal at 45% of median, compared to 155% last year. Precipitation in February was much below average, which brings the seasonal accumulation (Oct-Feb) to 71% of average. Soil moisture is at 36% saturation, compared to 58% last year. Forecast streamflow volumes (Apr-Jul) range from 23% to 43% of average.



# Northern Great Basin (cont'd)

NORTHERN GREAT BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point / Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Davis Ck (Acre-ft) | | | | | | | |
| APR-JUL | 1740 | 2450 | 3090 | 43 | 3910 | 5510 | 7233 |
| APR-SEP | 2100 | 2910 | 3640 | 46 | 4540 | 6290 | 7991 |
| Eagle Ck nr Eagleville | | | | | | | |
| APR-JUL | 0.0 | 0.4 | 1.0 | 23 | 2.2 | 4.0 | 4.3 |
| Bidwell CK nr Ft. Bidwell | | | | | | | |
| APR-JUL | 0.2 | 1.7 | 3.1 | 26 | 5.0 | 7.9 | 12.0 |

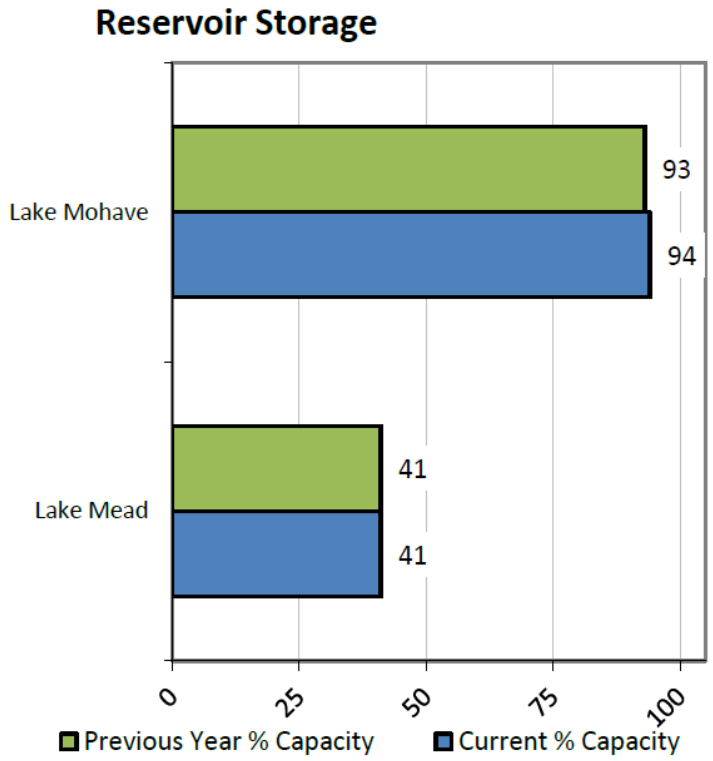
The average is based on the 1981-2010 reference period.

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

# Lower Colorado River Basin

From the Water Supply Outlook Report for Nevada
(https://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/):

Storage in Lake Mead is 41% of capacity, the same as last year at this time. Lake Mohave storage is 94% of capacity, compared to 93% last year. The forecast streamflow volume for Lake Powell Inflow is 43% of average.




COLORADO RIVER BASIN
Streamflow Forecasts - March 1, 2018

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

| Forecast Point Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | (% AVG.) | 30% (KAF) | 10% (KAF) | 30 Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|
| Lake Powell Inflow (2) APR-JUL | 1460 | 2360 | 3100 | 43 | 3940 | 5360 | 7160 |

The average is based on the 1981-2010 reference period.

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

# How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snowcourses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

*Issued by*

**Leonard Jordan**
**Acting Chief**
**Natural Resources Conservation Service**
**U.S. Department of Agriculture**

*Released by*

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# California Water Supply Outlook Report

**Natural Resources Conservation Service**
**Davis, CA**